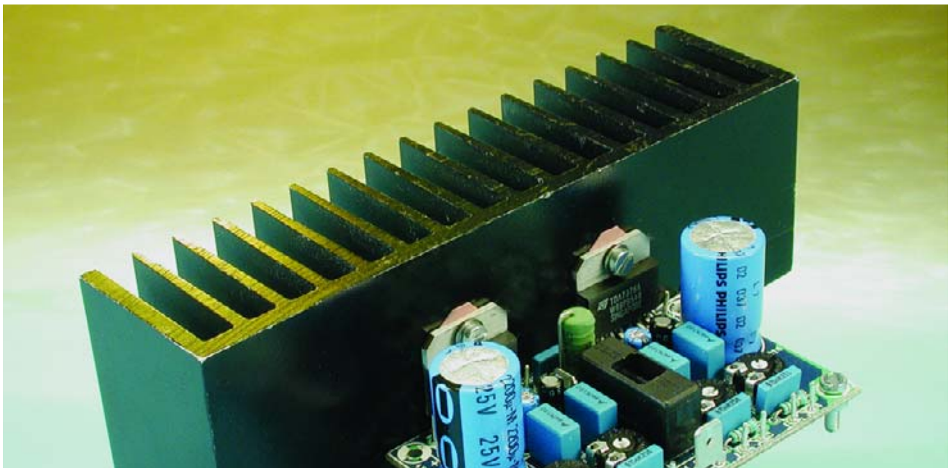
Quad Bridge Car Amp

059



Measurement results

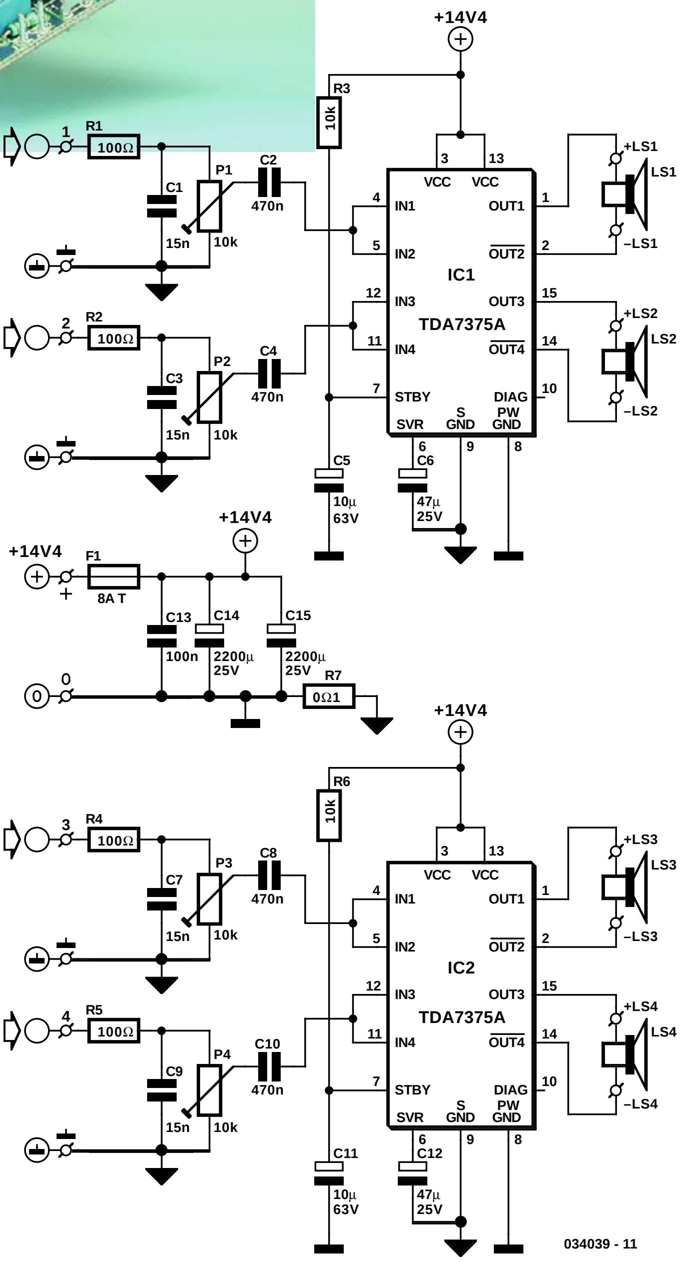
Supply voltage	+14.4 V
Quiescent current	200 mA
Pmax (THD+N = 0.1 %)	4 x 17.9 W (1 kHz, 4 x 4 Ω)
Sensitivity (P= 17.9 W)	0.46 V
THD+N (B = 80 kHz, 1 kHz, 1 W/4 Ω)	<0.03 %
Bandwidth	24 Hz to 55 kHz

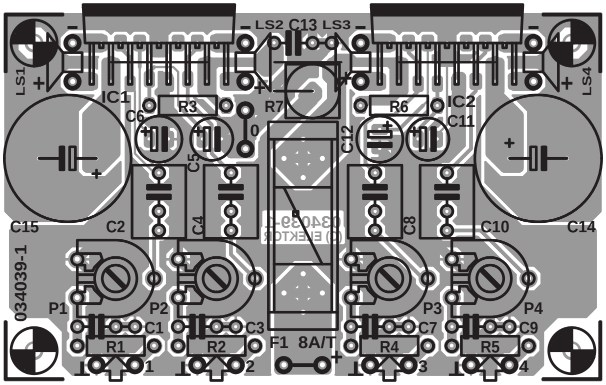
T. Giesberts

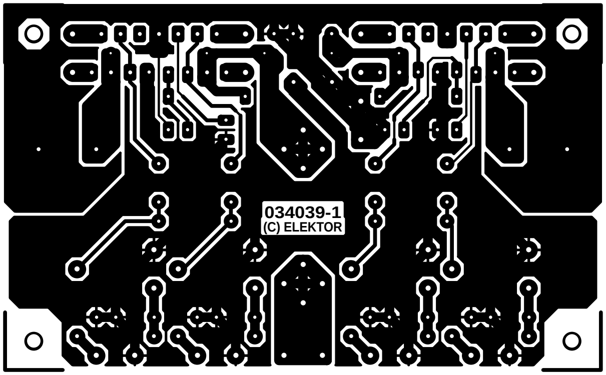
If you want to obtain more power at a given supply voltage (such as the battery voltage of a car) and you do not want to resort to a switched-mode power supply or class-H amplifier, your only choice is a traditional bridge amplifier. Various types of integrated versions have been available for years already. New types also appear regularly, such as the ST TDA7375A, which has the advantage that it requires very few external components. This IC is a pin-compatible successor to the TDA7374A, which can also be used in the circuit shown here.

Since many people nowadays are already used to surround-sound amplifiers, and it is common for more than two loudspeakers to be fitted in cars, four channels per module is just about the minimum. This is why we have fitted two ICs on a single circuit board for this design. The two ICs share common input and power grounds. These two grounds are connected by a 0.1-Ω resistor (R7), in order to limit the undesirable effects of ground loops when two ore more modules are used together.

The inputs have RC networks to suppress RF interference. The four channels can be aligned to each other using the four trimpots. The values of C2, C4, C8, and C10 are twice as great as in a single-ended configuration (see the 'Quad Car Amp' article elsewhere in this issue).







R3/C5 and R6/C11 ensure plop-free switch-on and switch-off. C6 and C12 decouple the internal voltage dividers, which bias the output stages at half the supply voltage. Both ICs are also well decoupled using separate electrolytic capacitors (C4 and C15). RF decoupling capacitor C13 is shared by the two ICs and located between them.

The printed circuit board has been designed to be as compact as possible, with the result that some of the connections are a bit cramped. The loudspeaker connections are located on both sides of the ICs. When connecting the loudspeakers, it is a good idea to cut the cables to the proper length and solder them directly to the circuit board. The power supply connections (which use car connectors) are located at the ends of the fuse holder ('0' and '+'). Don't forget the three wire links, and use insulated wire for the two links underneath the ICs to avoid shorts. The third wire link is right next to R7.

If the amplifier is driven to its maximum output level using four sine-wave signals, it draws 7.7 A! This is why an 8-A fuse is used to protect the circuit. In addition, a heat sink with a maximum thermal resistance of 1 K/W is recommended to provide adequate cooling. When fitting the circuit board, be careful with the corner holes next to he ICs. The copper extends to the holes here, in order to keep the circuit board as small as possible, so you must use plastic standoffs to fasten the board. Use insulating washers and rings to attach the ICs to the heat sink, in order to electrically isolate them from the heat sink.

(034039-1)

COMPONENTS LIST

Resistors:
R1,R2,R4,R5 = 100Ω
R3,R6 = 10kΩ
R7 = 0Ω1, 5W
P1-P4 = 10kΩ preset

Capacitors:
C1,C3,C7,C9 = 15nF
C2,C4,C8,C10 = 470nF
C5,C11 = 10µF 63V radial
C6,C12 = 47µF 25V radial
C13 = 100nF
C14,C15 = 2200µF 25V radial, max. diameter 16mm.

Semiconductors:
IC1,IC2 = TDA7375A (ST)

Miscellaneous:
F1 = fuse, 8A/T (time delay) with PCB mount holder
2 fast-on (spade) terminal, male, vertical, solder type (2-pin version)
PCB, order code **034039-1**